## Facility Management Standard

for facilities, infrastructure, & environment

### Standards Working Group Meeting

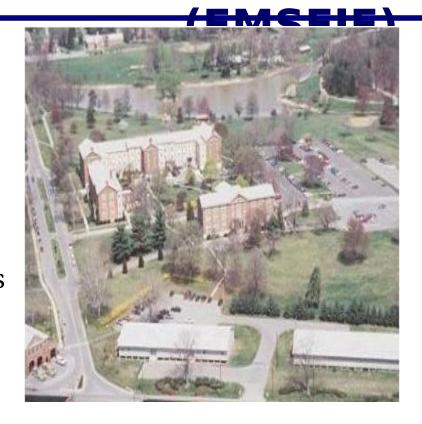
CADD/GIS Technology Center April 28, 2004

# Facility Management Standard (FMSFIE)

- Facility
   Management
   Standard for facilities,
   infrastructure, &
   environment
- Acronym FMSFIE
- CADD/GIS
   Technology Center
   Project No. 96.015



- Develop Transactional Data
   Content Standard to support life
   cycle Facility Management (FM)
   functions at Military Installations
   and USACE Civil Works Projects.
  - Facilitate compliance with legal reporting requirements.
- Improve efficiency and lower costs associated with collection, management, analysis, and reporting of FM data.
- Called Facility Management Standard for facilities, infrastructure, & environment (FMSFIE).
- Provide Non-Proprietary Data

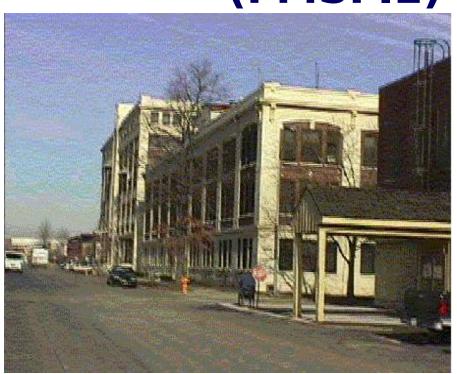


FMSFIE Website http://tsc.wes.army.mil/product
s/
tssds-tsfms/fms/fmsprods.asp

# 96.015 - Facility Management Standard (FMSFIE)

#### **Transactional** -

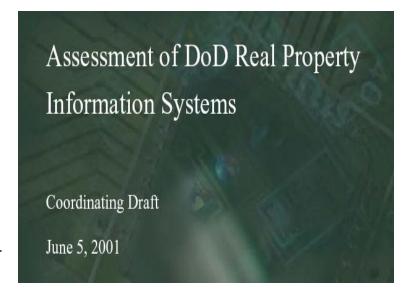
- Communicative actions or activities, involving multiple parties or things that reciprocally affect each other in a near real time setting that is based on life cycle events.
- Real Time, Temporal Data.



# Facility Management Standard (FMSFIE)

#### **Coordination:**

- FM Focus Group
- Patuxent River Naval Air Station (PAX)
- Army Integrated Facilities System (IFS)
- Air Force Interim Work Information Management System (IWIMS)
- Air Force Automated Civil Engineer System (ACES)
- Internet Navy Facility Assets Data Store (NFADS).
- USACE Facilities and Maintenance System (FEM)
- OSD Real Property Enterprise



 Defense Information Systems Agency (DISA)

# 96.015 - Facility Management Standard (FMSFIE)

# FMSFIE Development Components:

- Component 1 Prepare Technical Content/Guidance
- Component 2 Develop Software Tools
- Component 3 FMSFIE Meetings
- Component 4 Develop Transactional Data Models

• Component 5 - Maintain Federal Real Property

Managem

# Facility Management Standard (FMSFIE)

### FMSFIE Development

### FMSFIE Data Content Standard - Development

- Step 1: Develop/Update Strategic
  Plan
- Step 2: Develop Conceptual Data Model
- Step 3: Develop/Update Naming Conventions & Data (Information) Model Hierarchy
- Step 4: Identify Priority Areas, and Underlying Defined Focus Areas
  - Example:
    - Priority Area Asset Management with emphasis on Building Management



### FMSFIE Data Content Standard - Development

## Step 5: Develop/Update Data Moles for each Defined Focus Area

- Logical Models Developed 1<sup>st</sup> for each Focus Area
- Physical Models Define Detailed Table/Attribute Structure for importing into FMSFIE Library.

## Step 6: Develop/Update FMSFIE Library

Maintained in Microsoft Access Database.

## Step 7: Develop/Update Software Tools to Facilitate Use

- Browser
- Database Builder



## Facility Management Standard (FMSFIE)

#### FMSFIE Strategic Plan (FMSP) -

- Provides goals and objectives for development of FMSFIE.
- Provides plan for migrating FMSFIE to a transactional data model.
  - FMSFIE initially developed as subset of SDSFIE.



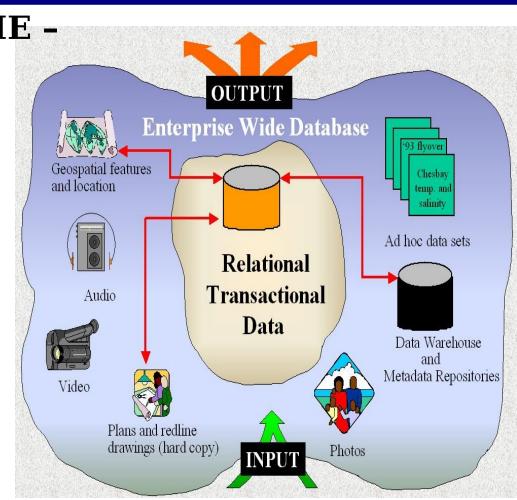
• Updated at October 2003 FMSFIE Working Meeting.

Initial Plan Developed

# Facility Management Standard (FMSFIE)

#### **Transactional FMSFIE -**

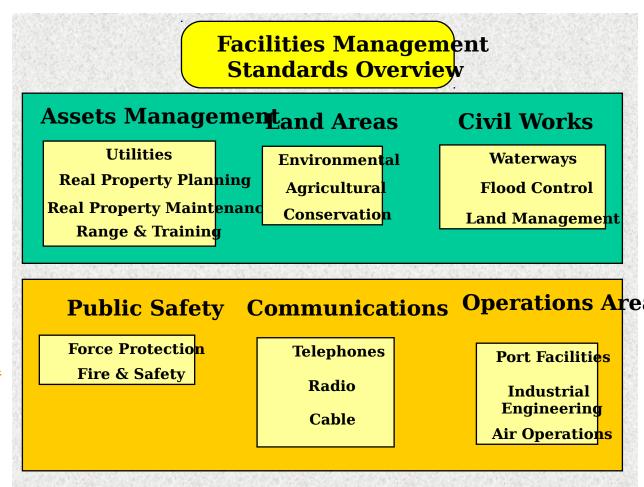
- Will be designed for management of lifecycle FM data.
- Will be designed to share data (be integrated) with both GIS (the SDSFIE) & CADD (A/E/C CADD Standards) technology.
- Will be designed for implementation on an enterprise (i.e.,



# Facility Management Standard (FMSFIE) - Broad Focus Areas for "Transactional" Data Model

Broad Focus areas
This is within the
Facilities,
Infrastructure and
Environment
Business Plan for
the Center

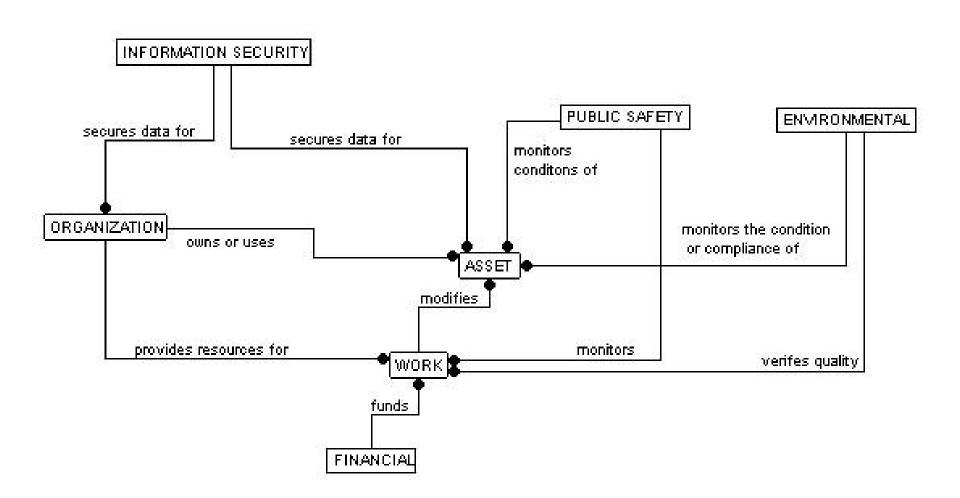
Work with the
Broad Associated
areas as the
need to support the
Broad Focus area
development.



### **FMSFIE Design Considerations**

- Compatible with Commercially Available Relational Database Management System (RDMS) Software.
- Compatible with SDSFIE & A/E/C CADD Standards.
- Compatible with Commercially Available CADD & GIS Software.
- Compatible with Microsoft Windows Operating Systems.
  - Windows 2000 & XL
- Define Data Model to Support Federal FM Legal Reporting Requirements.
- Support DISA and ISO Naming Conventions.
- Support Transactional Data Model & Schema.
- Provide User-Friendly Naming Conventions.
  - One Table Name & Attribute Field Name.
  - Table Names & Attribute Field Names are Meaningful to User.
  - Support Current & Future RDMS (i.e., DOS is not supported).

### FMSFIE Conceptual Data <u>Model</u>



### FMSFIE Data Model Hierarchy

FMSFIE Entity Set

FMSFIE Entity Class

FMSFIE Entity Sub-Class

> FMSFIE Entity Family

Relational Database

FMSFIE Data Table

FMSFIE Reference
Table

# FMSFIE Data Model Hierarchy Definitions

- **Entity Set:** Broad grouping of Real Property Management responsibilities.
- **Entity Class:** Sub-Grouping of an Entity Set providing grouping of similar real property classifications based upon legal reporting requirements.
- **Entity Sub-Class:** Sub-Grouping of an Entity Set based upon similar life-cycle event and temporal real property information.
- Entity Family: A functional sub-group of an Entity Sub-Class corresponding to different business disciplines, or different perspectives in the way data is

## FMSFIE Relational Database - Table Definitions

- **Data Table**: Relational database table comprising a grouping of similar records.
  - Also called Attribute table.
  - Database table used by Users for data entry.
- **Reference Table:** Relational database table containing a listing of valid, permissible, or reference values.
  - Also called Domain and Lookup Values.
  - Incorporate SDSFIE Domain Values, where applicable.

# Facility Management Standard (FMSFIE)

#### **Transactional FMSFIE -**

- Will include seven Entity Sets:
  - Asset Management
  - Work Management
  - Environmental Management
  - Organization Management
  - Public Safety Management
  - Information Security Management
  - Financial Management
- Guidelines for development defined by FM Focus Group.
  - Compliant with DoD (DISA) & International Standards Organization (ISO) requirements.

## FMSFIE Entity Set Definitions

**Asset Management:** Items comprising an inventory of federal real property and other related entities based on classification and need to support organizational requirements. Includes:

- (1) Tangible physical items comprising the inventory of federal real property that can be referenced by location;
- (2) Non-tangible items that cannot always be defined by a location, or do not exist as an inventory item in the real property management inventory.

**Work Management:** Change management that consists of planning, programming, acquisition, operations, maintenance, revitalization, evaluation, and disposal actions affecting real property (assets) and other related entities.

## FMSFIE Entity Set Definitions

**Financial Management:** Planning, programming, and execution of appropriations associated with real property management.

**Environmental Management:** Defines the stewardship responsibilities as they relate to the environmental management practices.

Public Safety Management: Issues related to the protection of personnel and property.

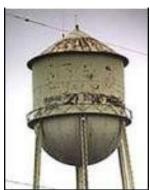
**Organization Management:** A structured grouping of personnel and the roles they perform as it relates to an integrated work environment.

## Initial FMSFIE Development Priorities

- 1<sup>st</sup> Priority Support basic Asset Management data requirements, with an emphasis on Building Management (Release 2.30).
- **2<sup>nd</sup> Priority** Utility & Environmental Management.







# **FMSFIE Asset Management Entity Set - Classes**

Asset Management - Set

Classes

Transportation

Non-Tangible

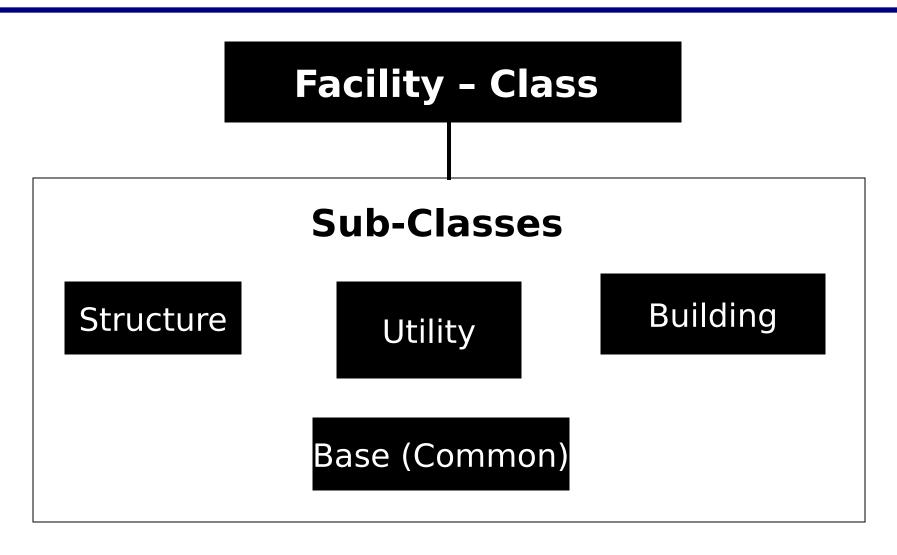
Core (Common)

Land (Real Property Class 1)

Facility (Real Property Class 2)

Equipment (Real Property Classes 3 & 4)

# FMSFIE Asset Management Entity Set - Facility Class - Sub-Classes



# FMSFIE Asset Management Entity Set - Facility Class - Building Sub-Class -

**Families** 

**Building - Sub-Class** 

**Families** 

Architectural

Structural

Security

Telecommunications

Fire Protection

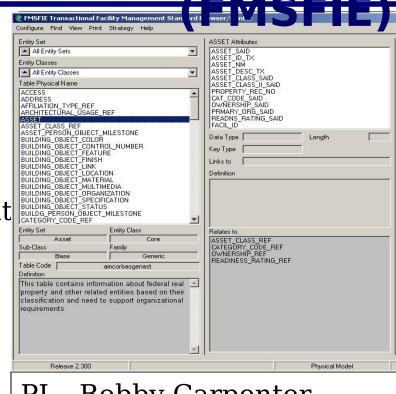
Mechanical

Electrical

Plumbing

Interior Design

- Published first transactional FMSFIE release (FMSFIE Release 2.30) in Oct. 03.
- Revised and expanded FMSFIE Website.
- Federal Real Property Management (RPM) Database and Website expanded to include 1,173 Federal Laws and Policy Documents.
- RPM Website Law Traceability Matrix Expanded for all SDSFIE and FMSFIE Sets & Classes.
- Prepared "FMSFIE Naming Conventions & Structure Specification" white paper.
- Developed first release of FMSFIE



PI - Bobby Carpenter

FY03 Major Accomplishmen

ts

# 96.015 - Facility Management Standard (FMSFIE)

FMSFIE Entity

Subclasses

FMSFIE Entity

**Families** 

FMSFIE Entity

Classes

# FMSFIE Release 2.30 (October 2003): • Supports basis Field 17

- Supports basic Federal Legal Reporting requirements for Asset Management.
- FMSFIE Browser provides viewing and printing capability of FMSFIE data dictionary

FMSFIE Entity

Sets

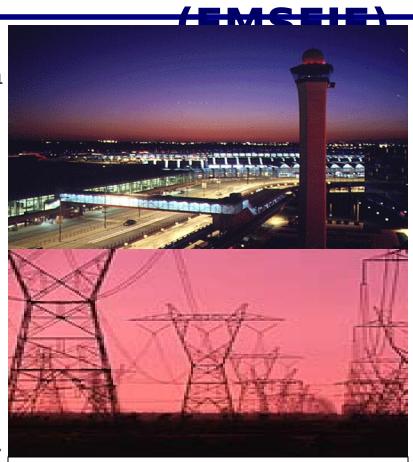
- Data Model:
  - Entity Sets 7
  - Entity Classes 39
  - Entity Subclasses 124
  - Entity Families 32
  - Database Tables (Adopted) 103
  - Table Fields (Attributes) (Adopted) 470
  - Reference (Domain) Values 5,033
- Distributed via Internet download and CD-ROM.

#### FMSFIE Website -

http://tsc.wes.army.mil/products/tssds-tsfms/fms/fmsprods.asp

#### Fiscal Year 2004 Priorities:

- 1. Publish 2 Updates of FMSFIE Data Library and Software Toolbox:
  - FMSFIE Release 2.31 March 2004
  - FMSFIE Release 2.40 October 2004
- 2. Expand Transactional Data Models:
  - Asset Management Buildings & Utilities
  - Environmental Management -Compliance & Sampling
- 3. Expand RPM Website and Content.
- 4. Develop Initial FMSFIE Assets Implementation Guidance.
- 5. Begin Migration of FMSFIE Data
  Models from IDFF to UML format



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# 96.015 - Facility Management Standard (FMSFIE)

#### FMSFIE Release 2.31 (March 2004):

- Includes Expanded Support for Asset Management.
- Includes Initial Support for Environmental Management
- FMSFIE Browser provides viewing and printing capability of FMSFIE data dictionary.
- Data Model:
  - Entity Sets 7
  - Entity Classes 38
  - Entity Subclasses 121
  - Entity Families 32
  - Database Tables (Adopted) 248
  - Table Fields (Attributes) (Adopted) 1,282
  - Reference (Domain) Values 5,033
- Distributed via Internet download and CD-ROM.

#### FMSFIE Website -

http://tsc.wes.army.mil/products/tssds-tsfms/fms/fmsprods.asp

# Component 1 (FY04) - Prepare Technical Content & Guidance:

#### C. FMSFIE Guidance -

- FM Strategic Plan -
- Naming Convention and Structure -
- Project Development Overview -
- Initial FMSFIE Implementation Guide -
  - Address how FMSFIE will integrate with SDSFIE & A/E/C CADD Standard
  - Demonstrate how to link FMSFIE data tables to CADD Drawings.
  - Discuss how to use FMSFIE for FM.





# Component 1 (FY04) - Prepare Technical Content & Guidance:

#### D. FMSFIE Data Library -

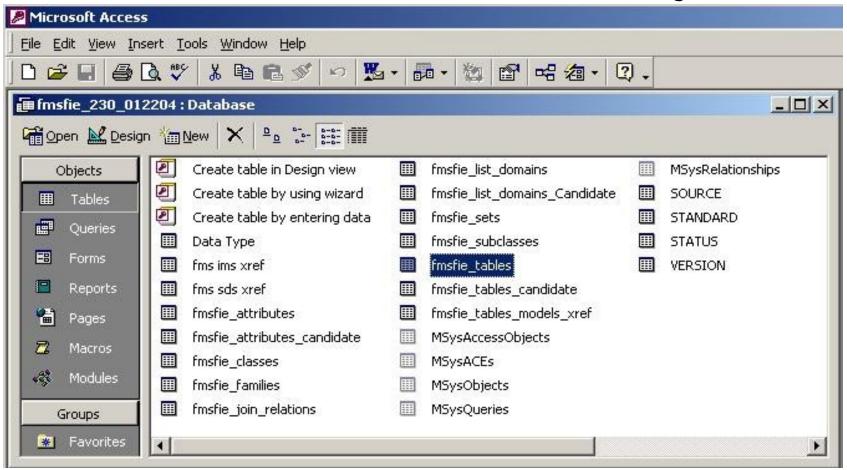
- Maintain Data Library -
  - Microsoft Access Database.
  - Contains Database Tables Comprising FMSFIE Library.
- Import Physical Data Models into Data Library -
- Research & Expand Content -
  - Tables, Table Fields, Definitions, & Reference Values.
- Perform QA/QC Testing of Library -
- Two Updates Scheduled to be Published in FV04 -







FMSFIE Data Library



### FMSFIE Data Content Standard - Library Update Process

- 1. New Data Elements added to FMSFIE Library are flagged as "Candidate".
  - Data Elements Tables, Attributes, & Domain Values.
  - Data Elements Incorporated in a Previous Release are Flagged as "Adopted".
  - Data Elements Changed from a Previous Release are Flagged as "Modified".
- 2. Listing of "Candidate" Data Elements is Distributed for Review Prior to Each Scheduled Release.
  - Exported from Library to Excel Spreadsheet.
- 3. "Candidate" Data Elements are Reviewed/Discussed at FM Focus Group Meeting.
- 4. FMSFIE Release is Completed

## Component 2 (FY04) - Develop Software Too

FMSFIE Transactional Facility Management Standard Browser/Printer Configure Find View Print Strategy Help

#### A. FMSFIE Browser -

- Provides Software Tool for Viewing and Printing of FMSFIE Library -
- Updated Annually to -
  - Maintain Compatibility with Microsoft Operating Syste
  - Incorporate Customer Comments
  - Improve Graphical User Interface (GUI)



- Visual Basic
- Tested for Operation with Windows 2000 and XP Operating Systems
- One Update of Desktop Browser Scheduled in FY04 -
  - Release 2.40 October 2004



### FMSFIE Release 2.30 Browser

FMSFIE Transactional Facility Management Standard Bro	wser/Printer	
Entity Set    A   asset	ASSET_CLASS_SAID ASSET_CLASS_PARNT_SAID ASSET_CLASS_NM ASSET_CLASS_DESC_TX   Data Type	Reference Values  Building Building/Utility Class 3 Class 4 Equipment Facility Land Material Handling Equipment Minor Property Non-Navy Property Non-Tangible Assets Structure Transportation Transportation Transportation Services Utility Vehicle Weight Handling Equipment  ASSET_CLASS_SAID  ASSET_CLASS_PARNT_SAID  ASSET_CLASS_NM  ASSET_CLASS_DESC_TX
_		
Release 2.300	Physical Model	\\MACK\HPLJ Room 1224

### Component 2 (FY04) - Develop Software Tool B. FMSFIE Implementation Tools -

- Investigate Technologies for Future Development -
  - Web Based (e.g., XML Web Based technology)
  - Computer Desktop (e.g., Visual Basic, similar to SDSFIE tools (SQL Generator & Access Builder)
  - Schedule dependent upon availability of FY04 Funds.
  - Develop Prototype Implementation Tool -
  - Web Based or Computer Desktop
  - Schedule dependent upon availability of FY04 Funds.
  - Perform QA/QC Testing of Software Tools -



# Component 4 (FY04) - Develop FMSFIE **Datssetfotbels**gement -

- Facility Class, Building Subclass Focus -
  - FY03 Architectural & Facility Baseline Models Completed (Release 2.30)
  - October 2003 Structural & Interior Design Baseline Models Completed
  - January 2004 Mechanical, Electrical, & Plumbing Baseline Models Completed
  - October 2004 Security & Telecommunications Baseline



### Component 4 (FY04) - Develop FMSFIE Data Models: A. Asset Management (Continued) -

- Facility Class, Utilities Subclass Focus -
  - October 2004 Water, Wastewater, Electrical, Fuel, & Heating Baseline Models Schedule dependent upon availability of FY04 funds.





# Component 4 (FY04) - Develop FMSFIE Data Model Stal Management -

- Environmental Compliance Class Focus -
  - October 2003 Environmental Checklist (NEPA Compliance Decision Tree) Baseline Model Completed
  - December 2003 Environmental Compliance Baseline Model Completed
- Environmental Sampling Focus -



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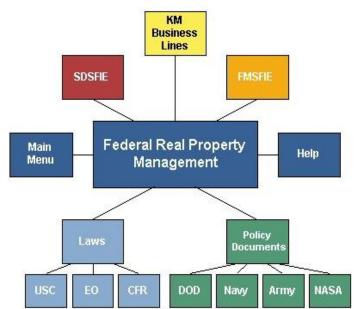


# Component 4 (FY04) - Develop FMSFIE Data Models to UML -

- UML Unified Modeling Language
  - Object Oriented Data Modeling Language
  - Microsoft Visio & IBM Rational Rose Most common UML modeling software
  - Has replaced IDEF in use and popularity
- Priority for Migration -
  - October 2004 Asset Management, Buildings Architectural & Facility Baseline Models
  - October 2004 Environmental Management, Sampling Baseline Model -
  - Asset Management, Buildings Structural & Interior Design Baseline Models

# Component 5 - Real Property Management (RPM):

- Web Site to contain U.S. Codes and Executive Orders governing acquisition, maintenance, and disposal of Real Property holdings.
- Provide Traceability Matrix listing of Federal Legal Reporting Requirements Supported by FMSFIE and SDSFIE. Coverage expanded each Fiscal Year.



# 96.015 - Facility Management Standard (FMSFIE)

Component 5 (FY04) - Maintain RPM

Website - Federal Real Property

Management Website -

- FY04 RPM Website Contract Support is Currently Awaiting Availability of FY04 Funds. Previous Contract has Expired.
- Projected FY04 Website Maintenance Priorities
- Maintain Compatibility with Microsoft Operating Systems & Internet Browsers
- Incorporate Customer Comments
- Incorporate New Federal Regulations & Policies
- Expand RPM Regulations to all FMSFIE Classes, Subclasses, Families, & Tables (Traceability Matrix completed in FY03 for

## Federal Real Property Management Website: F

TMSPIL LIMITY Set				
Entity Set	Entity Set Description			
asset_management	Items comprising an inventory of Federal real property and other related entities based on classification and need to support organizational requirements. Includes:  (1) tangible physical items comprising the inventory of Federal real property that can be referenced by location;  (2) non-tangible items that cannot always be defined by a location, or do not exist as an inventory item in the real property management inventory.	Class Link		
environmental_management	Defines the stewardship responsibilities as they relate to the environmental management practices.	Class Link		
financial_management	Planning, programming, and execution of appropriations associated with real property management.	Class Link		
information_security_managemen	Controlled access to data and information as it is related to the roles of personnel.	Class Link		
ganization_management A structured grouping of personnel and the roles they perform as it relates to an integrated work environment.		Class Link		
public_safety_management	Issues related to the protection of personnel and property.	Class Link		
work_management	Change management that consists of planning, programming, acquisition, operations, maintenance, revitalization, evaluation, and disposal actions affecting real property and other related entities.	Class Link		

**FMSFIE Entity Set** 

### Federal Real Property Management Website: I'M

	Laws Related To FMSFIE E	ntity: Ass	ets		
77	United States Cod	de			- 4
Law Number	Title		Full Text	Traceability Mat	trix Stat
40 USC 285 Bi	uildings under control of Administrator of General Services		Full Text	Related Information	Activ
	Executive Order	r			
Law Number	Title	Full Text	Tr	aceability Matrix	Statu
EO 12512	Federal Real Property Management F	ull Text	Related I	information	Active
EO 12803	Infrastructure Privatization F	ull Text	Related I	nformation	Active
	Policy Documents Related To FMS		ty: Assets		
	Department of Defe		ty: Assets		
Document Numbe	Department of Defe		-		Matrix Sta
	Department of Defe		Ful		
DODI 4165.3	Department of Defe	ense	Ful Ful	l Text Traceability l l Text Related Inform	nation Act
DODI 4165.3 DODI 4165.67	Department of Defe r Title Uniform Facility Classes and Construction Categories	ense	Ful Ful sistance Ful	l Text Traceability l l Text Related Inform	nation Act nation Act
DODI 4165.3 DODI 4165.67	Department of Deferment of Department of Deferment of Department of Deferment of Department of Deferment of D	ense	Ful Ful sistance Ful	l Text Traceability l l Text Related Inform l Text Related Inform	nation Act nation Act
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DODI 4165.3 DODI 4165.67 DODM 4145.19-R Document Numl	Department of Deferming Title Uniform Facility Classes and Construction Categories Revitalizing Base Closure Communities - Base Closure Co Storage and Warehousing Facilities and Services Navy Title	e <b>nse</b> ommunity As	Ful Ful sistance Ful Ful	l Text Traceability I I Text Related Inform I Text Related Inform I Text Related Inform	nation Act nation Act nation Act trix Stat
	Department of Deferming Title Uniform Facility Classes and Construction Categories Revitalizing Base Closure Communities - Base Closure Co Storage and Warehousing Facilities and Services Navy Title	e <b>nse</b> ommunity As	Ful Ful sistance Ful Ful Full Text	l Text Traceability I I Text Related Inform I Text Related Inform I Text Related Inform	nation Act nation Act nation Act trix Stat

### Federal Real Property Management Website. Si

#### Spatial Data Standards for Facilities Infrastructure and Environment

Entity Set	Description	Entity Classes
auditory	The generation and detection of sounds or noise in the environment.	Class List
boundary	The borders or boundaries that define logical or political divisions or subdivisions.	Class List
buildings	The structures located on the face of the earth that were created, by man, to protect man and his possessions from the environment, or to enhance man's activities.	Class List
cadastre	The man-made division of land into areas of ownership and control.	Class List
climate	The movement and effects associated with the earth's atmosphere.	Class List
common	The information that describes the overall data set or components of data that are common to all entity sets.	Class List
communications	The means available to relay data and translate data.	Class List
cultural	The activities of man that are historically significant.	Class List
demographics	The information pertaining to man's trends or traits.	Class List
ecology	The information pertaining to the interrelationship between organisms and their environments.	Class List
environmental hazards	The identification and management of natural and manmade substances, materials, and conditions which are, or have the potential to be, detrimental to life and ecosystems on the earth.	Class List
fauna	The study of the animals in a region or environment.	Class List
flora	The study of the plant life in a region or environment.	Class List
future projects	The information that describes planned projects for future development.	Class List
geodetic	The information pertaining to the size and shape of the earth.	Class List
geology	The geologic features and processes occurring in a given region on the earth.	Class List

# Facility Management Standard (FMSFIE)

#### Federal Real Property Management (RPM)

## Fiscal Year 2003 Content Status:

- Currently contains over 1,173
   Federal Laws & Policy
   Documents
- Contains Traceability Matrix of Federal Legal Reporting Requirements supported by:
  - All SDSFIE Entity Sets (total of 26).
  - All SDSFIE Entity Classes (total of 169).
  - All FMSFIE Entity Sets (total of 7).
  - 33 FMSFIE Entity Classes.

Total Number of Laws and Policy Docu	ments: 1173
Laws:	757
United States Codes:	265
Executive Order:	93
Code of Federal Regulations:	373
Other Laws:	25
Policy Documents:	366
Department of Defense:	73
Navy:	192
Navy Claimancy:	125
Army:	50
NASA:	32
Air Force:	1
Other Policy Documents:	15
External Document Links:	1144

### **QUESTIONS?**

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